



GENDER BASED INVOLVEMENT OF AGRO-INPUT DEALERS IN EXTENSION ACTIVITIES IN MAHARASHTRA STATE, INDIA

ARGADE S.*, SARKAR A. AND MISHRA S.

ICAR- Central Institute for Women in Agriculture, Bhubaneswar - 751 003, Odisha, India.

*Corresponding Author: Email- argadeshivaji@yahoo.com

Received: May 07, 2015; Revised: June 11, 2015; Accepted: June 12, 2015

Abstract- The heavy use of chemical fertilizers and pesticides by the farmers is becoming threat to sustain environmental security. One side, timely availability of critical farm inputs helps to increase farm productivity and another side, their optimum use helps to maintain environmental and economic balance. Hence, agro-input dealers can play major role in ensuring farmer's access to agricultural inputs and environmental security because they serve as the closest body to the farmers. The full participation of agro-input dealers is required to meet the challenges faced by extension system in India which can be achieved when they are perceived as subject of development especially women agro-input dealers. Towards this end, the small scale study was conducted in Pune district of Maharashtra with a random sample of 30 agro-input dealers (15 women and 15 men) to determine the extent of involvement of agro-input dealers in extension activities. Data were collected through well-structured interview schedule and analyzed by using descriptive statistics and multinomial logistic regression. It was observed that majority (53.34%) of the men agro-input dealers were less involved in the extension activities whereas the majority (66.67%) of the women agro-input dealers were moderately involved in extension activities. The maximum likelihood estimates indicates that gender, computer literacy and target farmer of agro-input dealers were found to be significant at 5% level of significance with their extent of involvement in extension activities.

Keywords- Agro-input dealer, Extension activity, Gender, Involvement

Citation: Argade S., Sarkar A. and Mishra S. (2015) Gender based Involvement of Agro-input Dealers in Extension Activities in Maharashtra State, India. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 7, Issue 3, pp.-470-473.

Copyright: Copyright©2015 Argade S., et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Introduction

After green revolution, our effort to achieve self-sufficiency in food production through excess use of agro-chemicals has led to contamination of food with harmful chemicals, pollution of ground water, degradation of soil quality and damage to agriculturally beneficial microorganisms. The both surface and ground water are becoming unfit for consumption due to high concentration of pesticide and fertilizer residues. The indiscriminate use of non-judicious fertilizer and pesticide application, especially in irrigated areas of the country has led to various kinds of physical and chemical degradation of the soil. In agriculture, timely availability of critical inputs and relevant information enable smallholder farmers to take right decisions for increasing their farm productivity as to sustain their livelihoods. This is one side of the coin. On another side, the optimum use required farm inputs helps to maintain environmental and economic balance. Hence, agro-input dealers can play major role in ensuring farmer's access to agricultural inputs and environmental security because they serve as the closest body to the farmers. When farmers do not have enough access to the formal extension services, they use other sources of information such as progressive farmers, asking to other fellow farmers, input dealers, etc. for advice. In India, according to Adhiguru, et al [1] the main information source for farmers was progressive farmers (16.7%) followed by

input dealers (13.1%), radio (13%), television (9.3%), newspapers (7%) and extension worker (5.7%). In terms of differences in accessing information sources, smallholder farmers relied primarily on progressive farmers, input dealers and radio for information while medium and large farmers equally used radio, TV, and newspapers. Yenagi, et al [2] also observed that most of the farmers (61.6%) approached private input dealers followed by friends, neighbors and relatives (50%) for getting the required agricultural information. The agro-input dealers play a vital role in guaranteeing farmers' access to essential agricultural inputs that enhance and sustain the agricultural productivity [3]. These observations tend to show that agro-input dealers can play a major role in ensuring farmers access to critical agricultural inputs as well as the information required to sustain their livelihood.

Similarly in abroad, Etyang [4] conducted study in Siaya and Trans Nzoia counties which showed that the mean value of the extension activities performed by the men agro-input dealers (49.4) was higher than the mean value of the extension activities performed by the women agro-input dealers (18.1). This implies that the gender of the dealer plays a significant role in determining the kind of support services extend to the farmers. Ogunlade, et al [5] also reported the extension related activities carried out by the agro-input dealers. However, in the areas of information dissemination, the agro-input

dealers seem to lag behind, they used to advise farmers regularly on appropriate chemical choice, and method of application, rate of application, method of planting, choice of fertilizer, rate of application, etc. These dealers were not able to link up farmers with other relevant institutions.

The roles of private extension system assumes importance in changing times when the public extension system in developing countries like India could not reach all the farmers due to lack of sufficient man power. Hence, the role of agro-input dealers in agricultural development goes beyond input distribution. The agro-input dealers need to stand in capacity of imparting knowledge. Despite this importance, the strategic role and position of the agro-input dealers has not been fully exploited especially in dissemination and communication of the key agricultural development technologies. Hence, there is need of strengthening of agro-input dealers by giving them financial and administrative support through policy reforms in hope that their endeavor could enhance the livelihood security of the resource poor farmers and sustain environmental security.

However, agro-input dealers still face many challenges. One of them is difficulty in obtaining new license and renewal of license. This was the time and cost consuming for both agro-input dealers and government officials. There was need of new initiative that it will help to come out of situation. Hence, agriculture department of Maharashtra government has started eParwana (Online licensing system for agro-input dealers) with the help of National Informatics Center, Pune to support the work of agro-input dealers in diverse socio-economic and bio-physical conditions. eParwana is a web based license management and information system which will help the Government authorities to grant license to agriculture input manufacturers and dealers. This is the time and cost saving mechanism for all the stakeholders involved in agro-input supply. Agro-input dealers can therefore supplement shortages and inadequacies of the public extension system in Maharashtra. Towards this end, the small scale study was conducted in Pune district of Maharashtra to determine the extent of involvement of agro-input dealers in extension activities.

Materials and Methods

The Maharashtra state and Pune district were selected purposively for the present study as they were the first state and first district in the India where eParwana (Online licensing system for agro-input dealers) was implemented on a pilot basis in the year 2012. Out of 14 talukas, Ambegaon taluka was selected randomly by lucky draw method. The list of agro input-dealers of Ambegaon taluka was obtained from eParwana website. There were 671 agro-input dealers in the Ambegaon taluka. Around 50 agro-input dealers including equal number men and women having working telephone or mobile numbers were randomly shortlisted from the list. The survey was conducted in February, 2015 by using face to face interview technique. The involvement of agro-input dealers in various extension activities was measured through a structured interview schedule. The respondents were asked to give their response on a three-point continuums viz., *always*, *sometime* & *never* with a score of 3, 2 and 1, respectively for each extension activity. The overall possible maximum and minimum score ranges between 69 to 23. Out of 50 responses, 30 responses consisting of 15 men and 15 women who had given the complete information and their views about extension activities were considered for final data analysis. Scores were summed up to get the total score for involvement in extension activities of each respondent. Then the respondents were grouped into

less involved, *moderately involved* & *more involved* categories by cumulative square root of frequency method. As the response variable (involvement in extension activities) is of ordinal type with three categories i.e. *less involved*, *moderately involved* & *more involved* and the independent variables were of both quantitative (age and experience in dealership) and qualitative (remaining variables) in nature, the relationship between dependent and independent variables was studied by using Multinomial Logistic Regression Analysis. The probability of having more involvement in extension activities related to farm input supply was modeled by using PROC LOGISTIC procedure of SAS 9.3[6]. Interpretations were made based on the odds ratio estimates and Wald confidence intervals.

Results and Discussion

Keeping in view the objective of the study, the empirical evidences obtained in terms of factual data were subjected to appropriate statistical tools and the findings thus arrived were presented and discussed. The findings are presented in the following heads;

Profile of the Agro-input Dealers

[Table-1] clearly depicted that only few (13.33%) men agro-input dealers were below 30 years old whereas women agro-input dealers of this age group were 53.33%. This showed that agro-input supply business was dominated by the men having age above 30 years. A higher proportion of younger women agro-input dealers as compared to their men counterparts indicated more willingness to come forward to serve the farming community. This might be due to the easiness in getting license through eParwana system which helped them to operate from their place. This kind of initiatives should be promoted for gender mainstreaming and women empowerment in agriculture. Only 26.67% of men agro-input dealers were agricultural graduate whereas 53.34% of women agro-input dealers were agricultural graduates.

Table 1- Gender based profile distribution of agro-input dealers

Profile (Range)	Men f (%)	Women f (%)	Overall f (%)
Age			
Up to 30 years	2 (13.33)	8 (53.33)	10 (33.33)
31 to 40 years	7 (46.67)	7 (46.67)	14 (46.67)
> 40 years	6 (40.00)	0 (0.00)	6 (20.00)
Educational background			
Agricultural	4 (26.67)	8 (53.34)	12 (40.00)
Non agricultural	11 (73.33)	7 (46.66)	18 (60.00)
Location of business			
Urban	2 (13.33)	0 (0.00)	2 (6.67)
Semi-urban	6 (40.00)	6 (40.00)	12 (40.00)
Rural	7 (46.67)	9 (60.00)	16 (53.33)
Target farmers			
Large farmers (>5 acres)	3 (20.00)	0 (0.00)	3 (10.00)
Small farmers (<5 acres)	7 (46.67)	3 (20.00)	10 (33.33)
Both	5 (33.33)	12 (80.00)	17 (56.67)
Experience in agro-input dealership			
Less (Up to 5 years)	2 (13.33)	11 (73.33)	13 (43.33)
Medium (5.1 to 9 years)	4 (26.67)	4 (26.67)	8 (26.67)
More (> 9 years)	9 (60.00)	0 (0.00)	9 (30.00)
Kind of input dealership			
Seed+Fertilizer+Pesticide	13 (86.67)	15 (100.00)	28 (93.33)
Fertilizer+Pesticide	2 (13.33)	0 (0.00)	2 (6.67)
Computer literacy			
Literate	9 (60.00)	12 (80.00)	21 (70.00)
Illiterate	6 (40.00)	3 (20.00)	9 (30.00)

f = Frequency; % = Percentage

This shows that women agricultural graduates are coming forward enthusiastically in agro-input supply business. Majority of men (46.67%) and women (60%) agro-input dealers had their business location in rural areas. This is the positive sign that they were more interested to serve farmers staying in rural areas. This might be due to win-win situation for both input dealers and farmers as majority of farmers were not interested to travel long for getting agricultural inputs. The majority (80%) of women agro input-dealers were targeting both the small and large farmers. This was the positive sign that they were equally focusing on both the farmers otherwise in majority of cases the small farmers used to suffer more as compared to large farmers. Only 20% of men agro-input dealers were targeted large farmers. This might be due to the number of small farmers increasing year after year as average land holding is decreasing continuously. Hence, being in the business in future both men and women agro-input dealers were targeting the small farmers. The majority (73.33%) of women dealers were found in less experience category. This might be due to majority of women dealers were below 30 years old and recently they are coming forward into agro-input supply chain. The majority of men (86.67%) and 100% of women dealers were having license for Seed + Fertilizer + Pesticide. This is good for farmers that they will get all necessary inputs at one stop. The majority of women (80%) and men (60%) dealers were found computer literate.

Extent of Involvement of Agro-input Dealers in Extension Activities

[Table-2] clearly indicated that the majority (53.34%) of the men agro-input dealers were less involved in the extension activities whereas the majority (66.67%) of the women agro-input dealers were medium involved in extension activities. This might be due the men dealers were more business oriented than farmer's wellbeing. This was reversing in case of women dealers. They were having more concerns about farmer's safety and productivity. This may conclude that the women agro-input dealers may be the next best option for timely supply of farm inputs and relevant information to the resource poor farmers. This kind of eAgri services should be promoted for improving women's access to the available resources and opportunities in order to empower them technologically, socially and economically. Overall 46.66% of agro-input dealers were medium involved in extension activities. This shows that there was acute need to motivate agro-input dealers in order to get them more involved in extension activities. Hence, future efforts should target the agro-input dealers for eco-friendly farm extension activities in order to improve farmer's access to relevant information & critical farm inputs as well as sustain environmental security.

Table 2 - Gender based distribution of agro-input dealers according to their extent of involvement in extension activities

Extent of involvement (Range)	Men f (%)	Women f (%)	Overall f (%)
Less (Up to 48)	8 (53.34)	0 (0.00)	8 (26.67)
Moderately (48.1 to 53)	4 (26.66)	10 (66.67)	14 (46.66)
More (> 53)	3 (20.00)	5 (33.33)	8 (26.67)

f = Frequency; % = Percentage

The content analysis of involvement of extension activities for the farmers by men and women agro-input dealers is presented in [Table-3]. In case of seed related extension activities, the mean score for men agro-input dealers (2.39) was more than the women agro-input dealers (2.28). The involvement of both agro-input dealers

was more in information on seed quality (3.00) and seed rate (3.00). The quality of seed and seed rate is having more contribution towards the increasing crop productivity. This is good sign that men and women agro-input dealers were involved more in such kind of activities.

In case of pesticide and fertilizer related extension activities, the mean score for men agro-input dealers (2.13 and 2.05) was less than the women agro-input dealers (2.49 and 2.43). The women agro-input dealers were involved more in pesticide and fertilizer related extension activities especially in case of use of bio-pesticides and bio-fertilizers (3.00). The present situation in agriculture demands to increase the use of bio-pesticides and bio-fertilizers. Hence, all the agro-input dealers should be motivated that they should get involved in such kind of extension activities in order to increase the use of bio-pesticides and bio-fertilizers by the farmers in order to sustain environmental security. It was satisfactory that men and women agro-input dealers were involved significantly in providing information about the rate of application of pesticides (2.60) and fertilizers (2.57).

In case of linkages related extension activities, the mean score for men agro-input dealers (1.73) was less than the women agro-input dealers (1.94). This shows that the women agro-input dealers were involved more than men agro-input dealers in linkage related extension activities. The women agro-input dealers (1.07) were lagging behind the men agro-input dealers (1.27) in linking farmers to the markets. It was satisfactory that the women agro-input dealers (2.67) were involved more than men agro-input dealers (1.60) in linking farmers to the research institutes.

Table 3- Gender based extension activity wise mean score of agro-input dealers

Extension activities	Mean score		
	Men	Women	Overall
Seed related	2.39	2.28	2.33
Information on seed quality	3	3	3
Seed dressing	2.27	2.13	2.2
On planting material	1.6	1.2	1.4
Seed rate	3	3	3
Method of sowing	2.07	2.07	2.07
Pesticide related	2.13	2.49	2.31
Choice of chemicals	3	2.87	2.93
Rate of application	2.6	2.6	2.6
Side effects	2.2	2.27	2.23
Methods of application	1.79	1.73	1.76
Use of bio-pesticides	1.07	3	2.03
Fertilizer related	2.05	2.43	2.24
Choice of fertilizers	2.93	2.8	2.87
Rate of application	2.53	2.6	2.57
Side effects	1.93	2	1.97
Methods of application	1.73	1.73	1.73
Use of bio-fertilizers	1.13	3	2.07
Linkage related	1.73	1.94	1.84
Progressive farmers	3	3	3
Credit institutions	1.47	1.13	1.3
Extension functionaries	1.8	3	2.4
Research institutes	1.6	2.67	2.13
Markets	1.27	1.07	1.17
Processing industries	1	1.07	1.03
Government departments	1.13	1.13	1.13
Agricultural implement agencies	2.47	2.2	2.33
Overall	2.03	2.24	2.13

Overall mean score of involvement in extension activities shows that the women agro-input dealers (2.24) were involved more than men agro-input dealers (2.03) in extension related activities for sustaining the livelihood of resource poor farmers. Hence, future efforts should target the women agro-input dealers through policy support in order to empower them socially economically and technologically. The results obtained in present study were in contrast with the results of Etyang[4] who conducted study in Siaya and Trans Nzoia counties which showed that the mean value of the extension activities performed by the men agro-input dealers (49.4) was higher than the mean value of the extension activities performed by the women agro-input dealers (18.1).

Table 4 - Odds ratio estimates and Wald confidence intervals

Independent variables	Estimate	95% confidence limits
Age	1.028	0.78 1.356
Experience in dealership	1.271	0.874 1.848
Gender (Men versus Women)	0.004	<0.001 0.187
Education (Non-agricultural versus Agricultural)	6.234	0.176 221.204
Computer literacy (Illiterate versus Literate)	0.02	<0.001 0.608
Location of business (Urban versus Semi-urban)	47.082	0.908 >999.999
Location of business (Urban versus Rural)	28.844	0.412 >999.999
Location of business (Semi-urban versus Rural)	0.613	0.049 7.589
Target farmer (Large versus Small)	109.509	1.69 >999.999
Target farmer (Large versus Both)	62.426	1.649 >999.999
Target farmer (Small versus Both)	0.57	0.052 6.289

The chi-square score for testing the proportional odds assumption was 18.94, which was not significant with respect to chi-square distribution with 10 degree of freedom ($p = 0.0410$). This indicates that the proportional odds assumption is reasonable. After performing multinomial logistic regression analysis in order to study the relationship between dependent and independent variables, the maximum likelihood estimates indicate that only gender (Probability > Chi-square = 0.0049), computer literacy (Probability > Chi-square = 0.0249) and target farmer (Probability > Chi-square = 0.0258) of agro-input dealers were found to be significant at 5% level of significance with their extent of involvement in extension activities. Further, 95% Wald confidence interval for odds ratios were computed. It was observed that women agro-input dealers were more involved in extension activities than the men agro-input dealers (As odds ratio estimate for gender is less than 1 and the confidence interval does not include 1), computer literate agro-input dealers were more involved in extension activities than the computer illiterate agro-input dealers (As odds ratio estimate for computer literacy is less than 1 and the confidence interval does not include 1), and the agro-input dealers who target only large farmers were more involved in extension activities than the agro-input dealers who target small or both small and large farmers (As odds ratio estimates for target farmer is more than 1 and the confidence interval does not include 1) [Table-4].

Conclusion and Recommendations

Women agro-input dealers unable to cope with the social and economical barriers that are inhibiting their contribution to agricultural development. Therefore, women agro-input dealers have not been given the opportunity to realize their full potential. The full participation of agro-input dealers is required to meet the challenges faced by present extension system in India which can be achieved when they are perceived as subject of development especially women

agro-input dealers. Therefore, this study provides relevant information towards the promotion of women agro-input dealer's involvement in extension activities. It was observed that the gender of the agro input dealer has an influence on the kind of support services that agro-input dealer offers to farmers. The women agro-input dealers were coming forward for serving farmers as they can operate from their place through effective use of ICT tools. The results from the study also indicated that the women agro-input dealers were more involved in extension activities as compared to men agro-input dealers. Hence, women agro-input dealers could be the best option for providing service support to the farmers and sustaining environmental security through eco-friendly farm input supply. In the light of above observations the study suggests the following:

There is a need to motivate the agro-input dealers to get them involved in providing farm extension services to the resource poor farmers.

All the stakeholders need to be encouraged to engage in awareness creation and capacity building of the agro-input dealers to effectively equip them with skills and knowledge essential in dissemination and communication of farm technologies.

There is need to target women agro-input dealers in order to strengthen them through policy support for effective transfer of farm technologies in future.

The large scale study may be conducted to explore the potential of women agro-input dealers in provision of support services to the farmers.

Conflicts of Interest: None declared.

References

- [1] Adhiguru P., Bithal P.S. & Ganesh Kumar B. (2009) *Agricultural Economics Research Review*, 22, 71-79.
- [2] Yenagi B.S., Yadahalli K.B., Gurumurthy R. & Naik L.K. (2012) *ICTs for agricultural extension: A study in Bagalkot district of Karnataka state, India*.
- [3] Ayieko M.W. & Tschirley D.L. (2006) *Enhancing access and utilization of quality seed for improved food security in Kenya*. Working Paper No. 27/2006.
- [4] Etyang T.B. (2013) *Assessment of the role of agro-input dealers in dissemination and communication of integrated soil fertility management: The case of Siaya and Trans Nzoia counties*, M.Sc. Thesis.
- [5] Ogunlade I., Atibioke O.A., Ladele A.A. & Adumadehin G.S. (2012) *International Research Journal of Agricultural Science and Soil Science*, 2(10), 426-435.
- [6] SAS (2011) *Base SAS® 9.3 Procedures Guide*. SAS Cary NC: USA.